

ART. IV.—THE ARCHITECTURE AND MECHANISM OF THE BRAIN.

By EDWARD C. SPITZKA.

CHAPTER I.

THE CENTRAL TUBULAR GREY.

Treating of the cranial nerve nuclei and the roots of the cranial nerves, from the third to the twelfth pairs, inclusive.

THE central tubular or axial grey is found in its clearest relations in the spinal cord. This is partly because there are no extraneous ganglionic systems here, *all* the spinal grey belonging to the central tubular form, partly because the spinal cord retains more of the features of the embryonic medullary tube than does the more complex encephalon. As a key to the elucidation of the systemic and functional relations of the cranial nerve nuclei, it will be, therefore, desirable to briefly review the most prominent features of the analogous spinal centres.

§ 55. Surrounding the central canal of the cord on all sides in the shape of the “grey commissure,” the spinal grey sends out two *cornua* into each half of the cord, an anterior and a posterior, which respectively enter into intimate relations with the anterior ⁽¹⁾ and posterior roots of the spinal nerves. Since the anterior nerve roots are known to be eminently devoted to conducting motor impulses, and the posterior ones are employed for the transmission of sensory impressions, the anterior cornu has come to be looked on as a motor nucleus, the posterior as a sensory one. There are numerous pathological and physiological facts which support this view; I should say, though, right here, that in a strict physiological sense, a sharp demarcation, especially as regards the sensory functions, does not exist. However, for the present we will in its general bearings consider the traditional view as correct.

although I am not able to exclude such connections with the trigeminal motor nucleus.

(52) See Chapter II.

(53) *Ibidem.* "Anterior pair" of the corpora quadrigemina.

(54) On a longitudinal section the roots are seen to be, as it were, gathered up near their origin from the nucleus into a denser bundle, and, diverging somewhat below, resemble a *cauda equina*.

(55) Particularly finely marked in turtles.

(56) Bruecke claims to have found that the junction of the two nerves is a commissure and not a decussation, after attempting to demonstrate that for physiological reasons a decussation was improbable (*Physiologie Vorlesungen*). Rohon, whose extensive material from a large range of animals should have enabled him to come to an independent conclusion regarding this very demonstrable point, blindly follows him (*Das Selachiergehirn*).

(57) The larger this ganglion the more completely it entraps these roots. Therefore they are relatively free in lower animals where the tegmental nucleus is small or absent. Thus the roots pass out directly without separation in reptiles.

(58) Forel has properly excluded a raphe connection (*Unters. über die Halbvenregion*).

(59) Its lower extremity is struck somewhat above the disappearing anterior end of the lower facial nucleus in horizontal sections; but the two seem to be always separated even when, as here, in the same plane.

(60) Against Forel (*Unters. üb. d. Halbvenregion*).
